

WHAT IS CLAIMED IS:

1. A heat exchanger comprising:

a first tube defining therein a first passage through which a first fluid flows, the first tube having a first inner side wall and a second inner side wall opposite to each other;

a second tube defining therein a second passage through which a second fluid flows, the second tube being joined to an outer surface of the first tube for performing heat exchange between the first fluid and the second fluid; and

a corrugated plate housed in the first tube, wherein

the corrugated plate has intermediate walls for partitioning the first passage, the intermediate walls include first walls, second walls, and third walls, each defining a first end and a second end opposite to each other,

each of the first walls is disposed such that the first end is proximate to the first inner side wall of the first tube and the second end defines an opening between itself and the second inner side wall of the first tube,

each of the second walls is disposed such that the first end and the second end are separate from the first inner side wall and the second inner side wall of the first tube for defining openings,

each of the third walls is disposed such that the first end defines an opening between itself and the first inner side wall of the first tube and the second end is proximate to the second inner side wall of the first tube, and

the first walls, the second walls, and the third walls are reiterative in an order of the first wall, the second wall, the

third wall and the second wall.

2. The heat exchanger according to claim 1, wherein
the intermediate walls connects ridges and grooves of the
corrugated plate, and
the ridges and the grooves includes flat surfaces.

3. The heat exchanger according to claim 1, wherein
the first fluid is water and the second fluid is refrigerant.

4. The heat exchanger according to claim 1, wherein
the first tube further defines an inlet through which the first
fluid flows in and an outlet through which the first fluid flows
out

the first tube has a rectangular flat box shape constructed
by joining a first plate and a second plate, which are produced
by drawing, at the peripheries thereof,

the corrugated plate has ridges and grooves each including
flat surfaces, and the flat surfaces are connected to inside walls
of the first and second plates.

5. The heat exchanger according to claim 1, wherein
the second tube is constructed of a plurality of capillary
pipes, and

the capillary pipes are spirally wound around the first tube
in parallel to one another.

6. The heat exchanger according to claim 1, wherein
the second end of the first wall is separate farther from the
second inner side wall of the first tube than the second end of
the second wall, and

the first end of the third wall is separate farther from the
first inner side wall of the first tube than the first end of the
second wall.

7. A heat exchanger comprising:

a tube defining therein an inside fluid passage through which
an inside fluid flows, wherein the tube defines a first inner side
wall and a second inner side wall opposite to each other; and

a corrugated plate defining ridges and grooves, wherein
the corrugated plate is disposed in the tube so that the inside
fluid passage defines a plurality of paths by intermediate walls
of the corrugated plate that connect the ridges and the grooves,
each of the intermediate walls defines a first end and a second
end opposite to each other,

the intermediate wall that is located between a pair of paths
defines openings between the first end and the first inner side
wall of the tube and between the second end and the second inner
side wall of the tube for allowing the pair of paths to communicate
with each other, and

the intermediate wall that is located between the pair of paths
and a subsequent pair of paths defines one of a first opening between
the first end and the first inner side wall of the tube and a second
opening between the second end and the second inner side wall of

the tube for allowing the two pairs of paths to communicate with each other,

thereby allowing the inside fluid to flow in and out the pair of paths and further flow in the subsequent pair of paths at the same time through the openings.

8. The heat exchanger according to claim 7, wherein the intermediate walls that are located between the two pairs of paths are alternately defines the first opening and the second opening with respect to the flow of the inside fluid.